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10/622,841

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Sridhar Srinivasan

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EXAMINER

ANYIKIRE, CHIKAODILI E

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/622,841	<b>Applicant(s)</b> SRINIVASAN ET AL.	
	<b>Examiner</b> CHIKAODILI E. ANYIKIRE	<b>Art Unit</b> 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) 1-16 and 48-77 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 48-77 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20040703, 20051003, 20051101, 20070529, 20080221</u>          | 6) <input type="checkbox"/> Other: _____                          |



### DETAILED ACTION

1. This application is responsive to application number (10622841) filed on July 18, 2003. Claims 1-16 and 48-76 are pending and have been examined.

#### *Information Disclosure Statement*

2. Acknowledgement is made of applicant's information disclosure statement filed on July 30, 2004.

#### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 5-8, 10-16, 48, 51-61, 63-64, 67-71, and 73-77 rejected under 35 U.S.C. 102(b) as being anticipated by Purl et al (US 5,227,878, hereafter Purl).

As per **claim 1**, Purl discloses in a computer system, a method of encoding a video image in a video image sequence, wherein the video image is partitioned into sets of pixels, the method comprising:

determining a value for a switch code (Fig 1, element 44a (inter/intra type signal); Col 12 Ln 65-67), wherein the switch code indicates whether a set of pixels is intra-coded (Col 12 Ln 65-67); and

jointly coding the switch code (Fig 1, element 44a (inter/intra type signal)) with motion vector information (Fig 1, differential motion vector) for the set of pixels (Col 12

Ln 50-59 and Col 13 Ln 22-28; the prior art discloses that both an inter/intra type signal and information related to the motion vector is encoded and combined together by a multiplexer).

As per **claim 2**, Purl discloses the method of claim 1 wherein the set of pixels is a block (Col 4 Ln 14-16 and Col 13 Ln 35-47; the prior art discloses using macro blocks, and sub blocks, which are both essentially blocks and therefore reads on dependent claim).

As per **claim 3**, Purl discloses the method of claim 1 wherein the set of pixels is a macro block (Col 4 Ln 14-16 and Col 13 Ln 35-47; the prior art discloses using macroblocks, and subblocks, which are both essentially blocks and therefore reads on dependent claim).

As per **claim 5**, Purl discloses in a computer system, a method of encoding a video image in a video image sequence, wherein the video image is partitioned into sets of pixels, the method comprising:

determining a value for a switch code (Fig 1, element 44a (inter/intra type signal); Col 12 Ln 65-67), wherein the switch code indicates whether a set of pixels is intra-coded (Col 12 Ln 65-67); and

jointly coding the switch code (Fig 1, element 44a (inter/intra type signal)) with motion vector information (Fig 1, element DIFF MOT VEC (differential motion vector)) for the set of pixels and with a terminal symbol (Fig 1, element (block classification

signal) indicating whether subsequent data is encoded for the set of pixels (Col 12 Ln 60-67) ;

wherein the jointly coding yields an extended motion vector code (Col 12 Ln 60-67 and Col 13 Ln 22-28; the prior art discloses that the output bitstream contains information related to the motion vector information and the type of coding, which leads to an extended motion vector code).

As per **claim 6**, Purl discloses the method of claim 5 further comprising jointly coding additional data for the set of pixels with the extended motion vector code (Col 12 Ln 60-67 and Col 13 Ln 22-28; the prior art discloses that the output bitstream contains information related to the motion vector information and the type of coding, which leads to an extended motion vector code).

As per **claim 7**, Purl discloses the method of claim 5 wherein the video image is a bi-directionally predicted video image (Col 6 Ln 12-14; the prior art discloses the use of B-pictures, which are known to be bi-directionally predicted video images), further comprising jointly coding an index for a reference image for the predicted video image with the extended motion vector code (Col 16 Ln 28-51; this section of the prior art indicates that there are storage units for a previous and next frame. The storage units can serve as index to the reference image).

As per **claim 8**, Purl discloses the method of claim 5 wherein the video image is a field-coded video image (Col 16 Ln 1-27; this section discloses a part of field-encoding as it relates to the claim), further comprising jointly coding an index for a reference field

for the field-coded video image with the extended motion vector code (Col 16 Ln 28-51; this section of the prior art indicates that there are storage units for a previous and next frame. The storage units can serve as index to the reference image).

As per **claim 10**, Purl discloses the method of claim 5 further comprising jointly coding an entropy code table index for the video image with the extended motion vector code (Col 22 Ln 6-16; this section of the prior art discloses having VLC tables and VLC is entropy encoding).

Regarding **claim 11**, arguments analogous to those presented for claim 2 are applicable for claim 11.

Regarding **claim 12**, arguments analogous to those presented for claim 3 are applicable for claim 12.

As per **claim 13**, Purl discloses the method of claim 5 wherein the set of pixels is a macroblock, and wherein the subsequent data comprises coded block pattern data (Col 8 Ln 6-8; the prior art discloses using a coded block pattern, which in turn suggest that the data is coded with the motion vector information).

As per **claim 14**, Purl discloses the method of claim 13 wherein the subsequent data further comprises residual data (Fig 1, 13 (estimate error signal); Col 13 Ln 1-10; the prior art discloses using an estimate error which represents residual data and indicates P or B type pictures).

As per **claim 15**, Purl discloses the method of claim 5 wherein the extended motion vector code is included in an extended motion vector code alphabet (Col 22 Ln 6-16; this section of the prior art discloses having VLC tables, which can be associated with the extended motion vector code and can be considered to be the alphabet).

As per **claim 16**, Purl discloses the method of claim 5 wherein the extended motion vector code is included in an extended motion vector code alphabet, and wherein the extended motion vector alphabet lacks a code representing a skip condition (Purl invention makes no mention of a skip-condition within the encoded bitstream, and therefore wouldn't have a skip-condition; therefore the claim is met).

As per **claim 48**, A computer-readable medium storing computer-executable instructions for causing a video decoder programmed thereby to perform a method of reconstructing one or more video images in a video sequence, the method comprising:

decoding (Fig 2) a set of pixels in an encoded bit stream (Col 15 Ln 23-32; it relates to the output video signal that is produced), wherein decoding comprises:

receiving an extended motion vector code for the set of pixels (Col 15 Ln 1-22; the prior art relates to the decoded motion vector and the other signals that are demultiplexed from the bitstream), wherein the extended motion vector code reflects joint encoding of motion information together with information indicating whether the set of pixels is intra-coded or inter-coded and with a terminal symbol (Col 12 Ln 60-67 and Col 13 Ln 22-28; the prior art discloses that the output bitstream contains information



related to the motion vector information and the type of coding, which leads to an extended motion vector code as referred to by claim 5);

determining (Fig 2, 54) whether subsequent data for the set of pixels is included in the encoded bit stream based at least in part upon the extended motion vector code (Col 15 Ln 1-22; the demultiplexer detects the data within the extended motion vector code).

As per **claim 51**, Purl discloses the computer-readable medium of claim 48 wherein the motion information comprises a motion vector for the set of pixels (Fig 1, element 24 (motion estimation circuit); Col 12 Ln 10-16; the prior using a motion estimation circuit, which is well-known in the art of image compression).

As per **claim 52**, Purl discloses the computer-readable medium of claim 48 wherein the extended motion vector code is preceded in the bit stream by header information (Col 27 Ln 35-40; the prior art clearly discloses in it's code that there is a sequence header, which precedes the extended motion vector).

As per **claim 53**, arguments analogous to those presented for claim 13 are applicable for claim 53.

As per **claim 54**, Purl discloses the computer-readable medium of claim 48 wherein the determining is based on the terminal symbol (Fig 1, element (block classification signal) indicating whether subsequent data is encoded for the set of pixels (Col 12 Ln 60-67)).

Regarding **claim 55**, arguments analogous to those presented for claim 3 are applicable for claim 55.

As per **claim 56**, Purl discloses the computer-readable medium of claim 55 further comprising receiving a second extended motion vector code for the macroblock (Col 12 Ln 8-9; the prior art discloses having two motion vectors per macroblock, but this translates into an extended motion vector code because the additional information is combined to motion vector).

Regarding **claim 57**, arguments analogous to those presented for claim 7 are applicable for claim 57.

As per **claim 58**, Purl discloses the computer-readable medium of claim 56 wherein the macroblock is a field-coded interlace macroblock (Col 4 Ln 9-20; the prior art covers applying the invention to field-coded interlace macroblock).

As per **claim 59**, Purl discloses the computer-readable medium of claim 55 further comprising receiving an extended motion vector code for each block in the macroblock (Col 4 Ln 14-16 and Col 15 Ln 1-22; the prior art relates to the decoded motion vector and the other signals that are demultiplexed from the bitstream and relates to each block).

Regarding **claim 60**, arguments analogous to those presented for claim 13 are applicable for claim 60.

Regarding **claim 61**, arguments analogous to those presented for claim 13 are applicable for claim 61.

Regarding **claim 63**, arguments analogous to those presented for claim 14 are applicable for claim 63.

As per **claim 64**, Purl discloses the computer-readable medium of claim 55 wherein the macroblock includes four blocks each comprising an 8x8 array of luminance pixels, and two blocks each comprising an 8x8 array of chrominance pixels (Col 4 Ln 53-57).

As per **claim 67**, Purl discloses the computer-readable medium of claim 48 wherein the extended motion vector code is a variable-length code (Col 8 Ln 62-62; the prior art clearly shows that variable length coding can be used to express the extended motion vector).

As per **claim 68**, Purl discloses the computer-readable medium of claim 48 wherein the extended motion vector code is different depending on whether the set of pixels in intra-coded (Col 12 Ln 65-67; the prior art discloses that the combined signal would be different since an inter code signal would be used for inter coding and intra code signal would be used for intra coding).

Regarding **claim 69**, arguments analogous to those presented for claim 48 are applicable for claim 69.

Regarding **claim 70**, arguments analogous to those presented for claim 5 are applicable for claim 70.

Regarding **claim 71**, arguments analogous to those presented for claim 48 are applicable for claim 71.

Regarding **claim 73**, arguments analogous to those presented for claim 4 are applicable for claim 73.

Regarding **claim 74**, arguments analogous to those presented for claim 51 are applicable for claim 74.

Regarding **claim 75**, arguments analogous to those presented for claim 52 are applicable for claim 75.

Regarding **claim 76**, arguments analogous to those presented for claim 13 are applicable for claim 76.

Regarding **claim 77**, arguments analogous to those presented for claim 54 are applicable for claim 77.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claim 4 rejected under 35 U.S.C. 103(a) as being unpatentable over Purl in view of Shimoda et al (US 5,734,783, hereafter Shimoda).

As per **claim 4**, Purl discloses the method of claim 1 wherein the value for the switch code indicates the set of pixels is intra-coded.

However, Purl does not explicitly teach and wherein the motion vector information comprises a pseudo motion vector.

In the same field of endeavor, Shimoda teach and wherein the motion vector information comprises a pseudo motion vector (Col 14 Ln 48-61; the prior art suggests that the inter/intra coding is decided by the amount of motion and that a motion detector is used to find a motion signal or motion vector; therefore the intra-frame would have a motion vector due to it being based on a threshold for both intra frame and inter frame coding).

Therefore, it would have been obvious for one having skill in the art at the time of the invention to modify the invention of Purl with the pseudo motion of Shimoda. The

advantage of combining the invention is decreasing the amount of distortion encoded for an image.

Regarding **claim 50**, arguments analogous to those presented for claim 4 are applicable for claim 50.

8. Claim 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Purl in view of Sugimoto et al (US 5,650,829, hereafter Sugimoto).

As per claim 9, Purl discloses the method of claim 5.

However, Purl does not explicitly teach the method of claim 5 further comprising jointly coding fading information for the video image with the extended motion vector code

In the same field of endeavor, Sugimoto et al discloses the method of claim 5 further comprising jointly coding fading information for the video image with the extended motion vector code (Col 15 Ln6-9; this section of the prior art discloses fade-in and fade-out information).

Therefore, it would have been obvious for one having skill in the art at the time of the invention to modify the invention of Purl with the fading information of Sugimoto. The advantage of combining the invention is decreasing the amount of distortion encoded for an image.

9. Claim 49 rejected under 35 U.S.C. 103(a) as being unpatentable over Purl in view of Tsukagoshi et al (US 2002/0106025, hereafter Tsukagoshi)

As per **claim 49**, Purl discloses the computer-readable medium of claim 48 wherein the extended motion vector code (Col 12 Ln 60-67).

However, Purl does not explicitly teach the computer-readable medium of claim 48 wherein the extended motion vector code indicates the set of pixels is skip-coded.

In the same field of endeavor, Tsukagoshi teach the computer-readable medium of claim 48 wherein the extended motion vector code indicates the set of pixels is skip-coded (paragraph [0043] and [0044]).

Therefore, it would have been obvious for one having skill in the art at the time of the invention to modify the invention of Purl with the skip-code of Tsukagoshi. The advantage would be an increased efficiency of encoding and decoding.

Regarding **claim 72**, arguments analogous to those presented for claim 49 are applicable for claim 72.

10. Claim 62 rejected under 35 U.S.C. 103(a) as being unpatentable over Purl in view of Suzuki (US 2003/0059118, hereafter Suzuki).

As per **claim 62**, Purl discloses the computer-readable medium of claim 61.

However, Purl does not explicitly teach wherein the coded block patten code comprises six bits, wherein coded block pattern code is selected from a coded block pattern code table, and wherein the coded block pattern table lacks an entry where all six bits are equal to zero.

In the same field of endeavor, Suzuki teach wherein the coded block patten code comprises six bits, wherein coded block pattern code is selected from a coded block

pattern code table, and wherein the coded block pattern table lacks an entry where all six bits are equal to zero (paragraph [0070] and [0075]).

Therefore, it would have been obvious for one having skill in the art at the time of the invention to modify the invention of Purl with the code block pattern of Suzuki. The advantage would be to provide efficient coding.

11. Claims 65 and 66 rejected under 35 U.S.C. 103(a) as being unpatentable over Purl in view of well-known in the art.

As per **claim 65**, Purl discloses the computer-readable medium of claim 55.

However, Purl does not explicitly teach wherein the macroblock includes four blocks each comprising an 8.times.8 array of luminance pixels, and four blocks each comprising a 4.times.8 array of chrominance pixels.

In the same field of endeavor, it is well known in the art to apply different coding methods to different formats of the luminance and chrominance signals. Therefore, the examiner takes Official Notice.

Therefore, it would have been obvious for one having skill in the art at the time of the invention to modify the invention of Purl with the well known of art of applying a coding method with different formats of the luminance and chrominance signal. The advantage is that the coding system applies to a wider range of video formats that are used today.



Regarding **claim 66**, arguments analogous to those presented for claim 65 are applicable for claim 66.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHIKAODILI E. ANYIKIRE whose telephone number is (571)270-1445. The examiner can normally be reached on Monday to Friday, 7:30 am to 5 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on (571) 272 - 7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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